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EXAMINER	
REZA, MOHAMMAD W	
ART UNIT	**PAPER NUMBER**
2136	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/726,229	BRODLEY ET AL.	
	Examiner	Art Unit	
	Mohammad W. Reza	2136	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *20 December 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-20* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *20 December 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *03/22/04-03/05/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-20 are presented for examination

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

The USPTO "Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility" (Official Gazette notice of 22 November 2005), Annex IV, reads as follows:

> Descriptive material can be characterized as either "functional descriptive material" or "nonfunctional descriptive material." In this context, "functional descriptive material" consists of data structures and computer programs which impart functionality when employed as a computer component. (The definition of "data structure" is "a physical or logical relationship among data elements, designed to support specific data manipulation functions." The New IEEE Standard Dictionary of Electrical and Electronics Terms 308 (5th ed. 1993).) "Nonfunctional descriptive material" includes but is not limited to music, literary works and a compilation or mere arrangement of data.
>
> When functional descriptive material is recorded on some computer-readable medium it becomes structurally and functionally interrelated to the medium and will be statutory in most cases since use of technology permits the function of the descriptive material to be realized. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure stored on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure stored in memory held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory).
>
> In contrast, a claimed computer-readable medium encoded with a computer program is a computer element which defines structural and functional interrelationships between the computer program and the rest of the computer which permit the computer program's functionality to be realized, and is thus statutory. See Lowry, 32 F.3d at 1583-84, 32 USPQ2d at 1035.

2. Claims 6, and 7 are rejected under 35 U.S.C. 101 because the claim invention is directed to non-statutory subject matter. According to the specification of the invention (Page 1-18) **"A computing device, comprising means for receiving data and programming instructions, means for processing the data according to the instructions"** is reasonably interpreted by one of ordinary skill as just software, it is a system of software, per se. In this claim the function of the device is just software not any hardware. Compare In re Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035

(Fed. Cir. 1994) (claim to data structure **stored** on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure **stored in memory** held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. Similarly, computer programs claimed as computer instructions per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions. So, it does not appear that a claim reciting software with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101.

3. Claims 8, and 9 are rejected under 35 U.S.C. 101 because the claim invention is directed to non-statutory subject matter. According to the specification of the invention (Page 1-18) **"A computer readable medium comprising instructions"** is reasonably interpreted by one of ordinary skill as just software, it is a system of software, per se. In this claim the function of the device is just software not any hardware. Compare In re

Lowry, 32 F.3d 1579, 1583-84, 32 USPQ2d 1031, 1035 (Fed. Cir. 1994) (claim to data structure **stored** on a computer readable medium that increases computer efficiency held statutory) and Warmerdam, 33 F.3d at 1360-61, 31 USPQ2d at 1759 (claim to computer having a specific data structure **stored in memory** held statutory product-by-process claim) with Warmerdam, 33 F.3d at 1361, 31 USPQ2d at 1760 (claim to a data structure per se held nonstatutory). Such claimed data structures do not define any structural and functional interrelationships between the data structure and other claimed aspects of the invention which permit the data structure's functionality to be realized. Similarly, computer programs claimed as computer instructions per se, i.e., the descriptions or expressions of the programs, are not physical "things." They are neither computer components nor statutory processes, as they are not "acts" being performed. Such claimed computer programs do not define any structural and functional interrelationships between the computer program and other claimed elements of a computer which permit the computer program's functionality to be realized. Accordingly, it is important to distinguish claims that define descriptive material per se from claims that define statutory inventions. So, it does not appear that a claim reciting software with functional descriptive material falls within any of the categories of patentable subject matter set forth in § 101.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 1-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carter et al hereafter Carter (US patent 5845331) in view of Lee et al hereafter Lee (US Patent 6996677).

5. As per claim 1, and 5 Carter discloses an apparatus comprising: an input/output unit, a control unit coupled to the input/output unit, an execute unit coupled to the control unit (col. 5, lines 50-67), a first memory area including memory that is accessible by a user of the computing device, and a second memory area including memory that is not accessible by the user (col. 2, lines 1-17, col. 2, lines 41-50). He does not explicitly disclose the second memory area being configured to store a plurality of return addresses and stack pointers. However, in the same field of endeavor, Lee discloses the second memory area being configured to store a plurality of return addresses and stack pointers (col. 2, lines 33-63).

Accordingly, it would been obvious to one of ordinary skill in the network security art at the time of invention was made to have incorporated Lee's teachings of storing the return address in the second memory location with the teachings of Carter, for the purpose of suitably using first and second memory locations to protect the attack on the return address (col. 2-4).

6. As per claim 2, Carter discloses the apparatus including: a first operation which stores a first address in the memory area, a second operation which compares the first

return address with a second return address retrieved from the memory area, and a third operation which generates an exception if the comparison indicates a mismatch between the first return address and the second return address (Fig. 2A, and Fig. 17, col. 2, lines 1-16, lines 41-60). Carter discloses the main concept of this claim limitations though, Lee's teachings give a better understand in combination with Carter to explain the steps of this claim limitations. Lee discloses wherein a first operation which stores a first return address in the first memory area and in the second memory area, a second operation which compares the first return address with a second return address retrieved from the first memory area, and a third operation generates comparison indicates a mismatch between the first return address and the second return address (col. 2, lines 32-61, col. 4, lines 46-62).

The same motivation that was utilized in the combination of claim 1 applies equally as well to claim 2.

7. As per claim 3, Carter disclose the apparatus comprising a third memory area including memory that is not accessible by a computer user (col. 2, lines 1-17, col. 2, lines 41-50). He does not explicitly disclose the third memory area being configured to store a plurality of return addresses and stack pointers. However, Lee discloses the third memory area being configured to store a plurality of return addresses and stack pointers (col. 2, lines 33-63).

The same motivation that was utilized in the combination of claim 1 applies equally as well to claim 3.

8. As per claim 4, Carter disclose the apparatus wherein the execute unit is operable to execute a plurality of operations including: a first operation that stores a first return address in the memory area, a second operation that copies the first return address to the third area if the second area is full, a third operation that retrieves the first return address from the third memory area, a fourth operation that compares the first return address with a second return address retrieved from the first memory area, and a fifth operation that generates an exception if the comparison indicates a mismatch between the first return address and the second return address. (Fig. 2A, and Fig. 17, col. 2, lines 1-16, lines 41-60). Carter discloses the main concept of this claim limitations though, Lee's teachings give a better understand in combination with Carter to explain the steps of this claim limitations. Lee discloses wherein a first operation that stores a first return address in the first memory area and in the second memory area, a second operation that copies the first return address to the third memory area if the second memory area is full, a third operation that retrieves the first return address from the third memory area, a fourth operation that compares the first return address with a second return address retrieved from the first memory area, and a fifth operation that generates an exception if the comparison indicates a mismatch between the first return address and the second return address (col. 2, lines 32-61, col. 4, lines 46-62).
The same motivation that was utilized in the combination of claim 1 applies equally as well to claim 4.

9. As per claim 6, 8, 9, and 10 Carter discloses a computing device, medium comprising: means for receiving data and programming instructions, means for

processing the data according to the instructions, means for storing return addresses generated by the means for processing in a first memory area (col. 5, lines 50-67), means for storing the return addresses in a second memory area not accessible by computer users (col. 2, lines 1-17, col. 2, lines 41-50). He does not expressly discloses means for evaluating a return address from the first memory area and a return address from the second memory area to determine whether an attack on a return address has occurred. However. Lee discloses means for evaluating a return address from the first memory area and a return address from the second memory area to determine whether an attack on a return address has occurred (col. 2, lines 32-61, col. 4, lines 46-62). The same motivation that was utilized in the combination of claim 1 applies equally as well to claim 4.

10. As per claim 7 Carter discloses the computing device comprising: means for generating an exception if the means for evaluating determines that an attack has occurred (Fig. 2A, and Fig. 17, col. 2, lines 1-16, lines 41-60).

11. As per claim 11 Carter discloses the method wherein the step of generating an exception includes generating a hardware exception (col. 4, lines 51-60).

12 As per claim 12-14 Carter discloses the method wherein the storing step is performed if a call instruction is encountered in the computer program, wherein the retrieving, comparing, and generating, steps are performed if a return instruction is encountered in the computer program, wherein the comparing step is performed at the time of a return instruction commit (col. 2, lines 1-16, lines 41-60).

13. As per claim 15-18 Carter discloses the method wherein the comparing step includes the steps of: recognizing when a data port is not available to accomplish the comparison, and stalling issuing instructions until a data port is available, wherein the storing step includes the step of copying the first return address from the second memory into a third memory that is not accessible by computer users, comprising the step of copying at least a portion of the contents of the second memory into a third memory that is not accessible to computer users if a context switch instruction is encountered in the computer program, comprising the step of copying at least a portion of the contents of the third memory into the second memory (col. 2, lines 1-16, lines 41-60).

14. As per claim 19-20 Carter discloses the method comprising the step of comparing at least a portion of the contents of the first memory with at least a portion of the contents of the second memory if a jump instruction is encountered in the computer program, comprising the step of inserting a random number into the first memory if a jump instruction is encountered in the computer program (col. 4, lines 51-60, col. 2, lines 1-16).

Conclusion

15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mohammad w. Reza whose telephone number is 571-272-6590. The examiner can normally be reached on M-F (9:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, MOAZZAMI NASSER G can be reached on (571)272-4195. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Mohammad Wasim Reza

AU 2136

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